

Science Broadcasting: Experiences, explorations and experiments

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Abstract

This is a personal journey with events that evoke emotions, provoke passions, and pose problems. In real life, aims, goals and objectives meet chance and necessity at different points of time and happy coincidences provide opportunities for one to serendipitously stumble upon solutions. Summarising the last three decades of this journey leads to strategies for improving science coverage in Indian television.

In the beginning

1982. As a young man struggling to survive as a freelance science journalist, I faced an interesting proposition: "You have so many interesting science ideas. Why don't you write a script for me?" I had no problems collaborating with the freelance TV producer, a friend.

Writing in newspapers and magazines, however, had not prepared me to write scripts for television. But the revisions that they underwent in discussions with the producer, and seeing the script get executed as a programme, did the trick. So the second script for another producer was faster. I could even make myself useful during production. And then, writing the narration script for yet another producer completed my course on script and narration writing.

In the process, I realised that, though these producers were all involved with science programmes, none of them had a background in science. Studying foreign languages, political science, or international relations, they had wandered into producing science because they were interested in film making. (TV used black-and-white 16-mm film those days, and it was a stepping stone to the film industry.)

So I went to Old Man Charlie, the Chief Editor of Television News Features, with yet another script and requested him to let me direct it. Having seen shooting, editing, animation, etc., at close quarters for three programmes, I was ready. Charlie would not stand in the way of scripts. But he would sit with the producers after shooting and editing, and look at the narration script. He would read each sentence and even repeat some words, asking: "will this be understood by the rickshaw puller?" He did this with each narration script for all the five programmes that I produced there later. What better training could one have?

Changing technologies, evolving skills

Suddenly the technology changed: video became the medium for TV production. And I wandered into educational television. A degree in physics and a Masters in life sciences were not qualifications that people look for in a TV producer. But for making science programmes they had advantages. Five black-and-white films were good enough as certificates to enter the world of educational television. It did not take much time for me to be known as a "science" producer amongst those making UGC programmes. (A label which I had to shake off quickly by making a few programmes in arts and humanities.)

In terms of making TV programmes, it does not really matter whether it is science or arts or sports or humanities that we are dealing with – the techniques and styles of production, however, make a large difference to whether the programme is worth watching. Ultimately, it is the passion of the producer and his or her insights about the subject of the programme that makes a production excellent. If we are not moved by an idea, we cannot make a programme that moves others.

The shift from science to education in general gave me the scope to experiment with the medium. "Footage" in video was not as costly as in film. The cameras were easier to handle. And cameramen were not as possessive about their equipment as they were when film was used. Moreover, one was supposed to edit one's own programmes. No editor to cut and splice. No lab for processing. One could see the results immediately. The freedom to do what I liked was incentive enough to push my limits in the attempt to master the medium – and to understand education in its broadest sense.

When institutional changes clamped down on that freedom, I left quietly. Private sector television studios were opening up. And I found myself managing productions instead of producing. The excitement of shooting and editing was gone. The focus was on the message and the masses. A series of health spots with a common theme "*jara si savdhani, zindagi bhar asani*" changed the way I approached television. I did not own a television set in those days. But I could hear the refrain in the street. Seemingly endless repetitions that do not necessarily bore people.

Education calls for repetition. If I had suggested making one-minute educational programmes, would policy makers understand? Making one-minute spots called for skills different from those of making a documentary. And a one-minute news story calls for yet another set of skills. I was learning from what Marshal McLuhan called school – the world around me.

From doing to teaching

Learning from doing does not prepare one to teach. The unanticipated challenge of being the Director of a post-graduate diploma course in Science Journalism in the late 80's made me master issues related to science and journalism from a different perspective. I learnt a little formal journalism: teaching others is good incentive for learning declarative knowledge.

Theories of communication given in text books did not satisfy me. The need to base communication theory in the context of information theory on the one hand and the findings in neurosciences and sociobiology on the other, led me to attempt formulating some academic papers later. For the course, I merely gave references to the books and skipped teaching them. Conveniently.

Instead, I focussed on the practical work: the content, structure and style of the students' output. The academic inputs were related to philosophy, methodology, history, organisation of scientific research in India, sources of information, and dealing with the information explosion. These were the missing links that a science graduate does not learn, but are crucial for science journalists. General introductions to the processes in media and detailed discussions on the different elements of each media gave the students a background for adapting to the media environment.

Does all this make a science journalist? Of course not! But it was evident that all the students in the course learned to write well. 25 articles in a span of nine months, and receiving detailed feedback on each, will do that to anybody.

As I went back into TV production as Chief Producer of Medical Television, the question that kept nagging me was – What are we missing out on in journalism education in the university setting?

Back to action

Video as a medium for health communication to the public, for patient education, for training of paramedics, and for continuing medical education: it sounded as good at that time as it does now. But the

time was not ripe then. Taking a salary for not doing much was not my cup of tea. So soon I was tagging along with NGOs.

A media package consisting of a video to train women to repair hand pumps, trigger tapes to initiate a discussion on the issue of water, hand pumps, women *mistries*, maintenance of hand pumps and sanitation, a handbook in comic book format so that even semi-literate women could learn the processes involved in repairing deep-well hand pumps, flipcharts and posters to be given to women who are trained – the making of the kit was a tedious process. But I learnt a lot about many development issues in a very short time – water, sanitation, health, gender, poverty, education – and their relationship with science and technology – geology of aquifers, water-cycle, integrated land and water management...

Suddenly I found myself in the area of development communication. There was a lot to be done. But there were no resources. And one had to survive. So I went back to mainstream television.

Tackling the information explosion

The technologies for TV production and transmission have changed drastically again and again, in the last three decades. Keeping up with the technology and mastering the new tools of production was never a big hurdle. But keeping up with the advances in science was becoming difficult. And then came the Internet, and easier access to scientific databases; just in time to help me when I started producing the popular science serial 'Turning Point'.

The Indian National Scientific Documentation Centre (INSDOC) had started a service called CAPS. They would provide the list of contents of the scientific journals that you selected and if you found any paper worth pursuing because of its title you could ask for the abstract and if you found the abstract interesting, you could ask for the full paper. The service was meant for scientists. But I made full use of it.

As a science journalist earlier, I used to scan *Current Contents* – a journal series that listed the contents of most journals. But then, I had to go to the university library to access *Current Contents*. The service that INSDOC offered had the option of getting the data on a floppy disc. I could sit in my office or at home and do my research.

I subscribed to 400 reasonably good journals, spanning broadly, all scientific disciplines. Scanning through just the titles of all papers from 400 journals was an

educational experience. Quite often, one was compelled to look at the abstracts. And at times the full paper. I felt like I was on the frontiers of science, without being a scientist. In fact, most scientists are not interested in topics outside their expertise. I had a ring-side view of science.

It also proved to be quite useful when talking to scientists. I was quite at ease with the terminology that they use. Of course, in the programmes one had to use simple common speech understandable to the proverbial rickshaw puller. But that does not mean that one cannot spout a few terms to signal to scientists that they could talk to me as to an equal, making interactions more fruitful, in less time.

When dealing with TV producers, some scientists like to pretend that they are the only ones working on a specific problem. Dropping references to some papers in their field during the conversation was a useful technique that I developed during those days: it stopped them from following that line, without hurting egos.

The boom and bust of dot com left behind wider Internet access. The conversion of the Internet into the commoner's medium and digital convergence, the marriage between TV and computers - had been formalised. A producer today does not have to wait for the monthly package of diskettes from INSDOC, but will perhaps go through scirus.com or Google Scholar on a day-to-day basis. The retrospective data available now, is accessible even to literate housewives.

Education: From production to programming

Dealing with the information explosion on the one hand, and the tight deadlines of a TV medium on the other, was not so easy then. As the Producer of Turning Point in the early '90's, I realised that I had to depend on others and follow the processes of a production line to meet the deadline week after week. Hence came the training of young people in TV production, allowing them to learn on-the-job, as I had learned.

It was easy to train people who had a bachelors' degree. But when I tried to get help by hiring Masters and PhD scholars, the going was not so easy. Skill building took longer. However, once they learnt the skills, they had better mileage. They could handle technical content with more accuracy and credibility.

That was a rude awakening to the process of learning in adults. But before I could reflect on the issue and hone my skills and deepen any insights in that field, I had moved on to handling the UGC broadcasts on Doordarshan.

The broadening of scope from science to education as a whole was, again, intellectually stimulating. The problem of dealing with 17 production centres distributed in different parts of the country shifted my attention away from science and into the management of broadcasting.

The task of packaging three or more programmes to fit into one-hour slots was not difficult. I had learnt that packaging was as important as production when dealing with Turning Point. But scheduling was a different game altogether. To deal with the problem of the shifts in viewers' demographic profiles with the time of the day could be tackled only by appropriate programming. Moreover, I was getting deeper into educational broadcasting, specifically to issues related to quality of production and programming as well as accuracy of the content and its relevance for the target audience. The international quality standards for management were not good enough to deal with the issues of broadcasting management. I did not know at that time, that the work on International Standards in Quality Management was being adapted for Broadcast and Print Media.

At the level of production, one had to fight the notion that education somehow has to be boring and even painful (e.g. teach a lesson, *shiksha* in Hindi which originally meant punishment) to be really effective. I gave myself a crash course on educational theories and pedagogic strategies. The inherent contradictions between the philosophies of media and of education had to be reconciled.

Moreover, the Ministry of Human Resources had transgressed into the territory of the Ministry of Broadcasting and was trying to convert it into a classroom. The work culture and ethics of the two industries - education and broadcasting - were not too congruent or even similar. Policies that did not take into account these differences had created a system that was tying itself into knots, trying to be in two boats at once.

Meanwhile, the number of satellite channels kept rising. The manufacture of satellites started adopting the production line model adopted by the automobile industry. And even UGC was given a channel. Educational television in the country faced the crisis of supply of frequencies far beyond the manpower needed to use them in any sensible way.

Running a channel which nobody watches, calls for the same effort as running a channel that everybody watches. Government sector rules do not allow converting a channel that nobody watches into something that at least 22 million would love to watch. I got out of it as fast as I could.

Leaving a job does not mean losing track of the problems and seeking solutions. I carried the questions forward. What is it that we could do to make a channel work? Given the latest technology and unlimited finances? What are the limiting factors? What can one do practically, to improve the quality of broadcasting?

Training to capacity building

As if to help me tackle these questions, my next job was to organise seminars and conferences for broadcasters in the Asia-Pacific region. Capacity building of broadcasters including sensitising and orienting them to deal with even cultural and religious issues helped me to understand broadcasting better and broadened my vision in terms of programming. Involvement with international broadcasting quality standards ISAS BC 2000 helped me understand broadcast management – human resources, technology, marketing, finance etc. – better.

In this avatar, I had to take up the training of TV and radio professionals in many different countries. The breakneck speed at which one works, does not allow time for reflections or pursuit of one's scientific quests. But many workshops with TV and radio producers taught me the difference between telling, teaching and training. Development of training tools was the only way to tackle the enormous need for adequate training in the broadcast sector in the region.

Developing training tools and materials

The skills in provoking emotions and psychosocial change through broadcast media became the focus when a series of workshops on HIV issues came my way. HIV became a pretext for me to enquire into health communication as a whole. The narrowing of perspective was useful. The ideas crystallised into a book titled: *HIV on TV – Getting the Story and Telling it Right*, a handbook for TV producers and trainers.

(Available at <http://unesdoc.unesco.org/images/0018/001843/184320e.pdf>).

The task of putting together a minimum standard for HIV communication through media (Available at http://www.thegmai.org/JC1657_MinimumQualityStandards_eng.pdf) gave me the opportunity and time to think about development communication again. The narrow task area was able to teach me a lot about a wider area of operations.

The task of creating a science kit for broadcasters suddenly fell into my lap. As preparation for this book, I sent out a questionnaire to 26 countries in the Asia

Pacific region, to understand my target audience. And I realised that some broadcasters do not have producers with science degrees. At the other end South Korea had a doctor with MD to take care of health programmes. And then came a series of workshops for radio and TV producers on Broadcasting Science – in countries where there was virtually no science programming. This provided an opportunity for me to test out the content for the book titled *Broadcasting Science* (available at aibd.org.my/books).

While I came back a full circle to science broadcasting, but more as a trainer, the medium itself had undergone major changes. YouTube and video sharing technologies have attained a stable position in the media landscape. And the tools of production – a video camera and a computer – have become commonplace in institutions and homes. A revolution in the Marxist sense had occurred: workers could own the tools of production.

From printing press to ballpoint pen to keyboards (and mouse!), the democratisation of the printed word had taken much longer than video. But in a short span of three decades video has become a citizen's tool to communicate – even across national boundaries. The potential growth and development in this area is yet to be reached. A book *Social Video: Tips and Tricks for Citizen Journalists*, published by Publication Division, Ministry of Information Broadcasting in 2011 (not available freely on the web as the earlier references) was a step to fulfill the needs of any citizen wanting to use video.

But then, though video is used so abundantly even in the rural areas of India, it is not sufficiently understood by scientists, researchers, teachers and extension workers. It is almost as if those who have something to say are mute while village idiots are given loudspeakers.

It appears that scientists need to be trained if a channel – as mooted by the Knowledge Commission and as actively “considered” by CSIR and other organisations – has to become viable and sustainable.

A Science Channel?

There are more than 400 TV channels in India. One more of course, may not hurt. So why not?

While there are channels fully focussed on politics, business, religion, music, sports or fashion, (why, even one that is focussed only on golf) a channel focussed on science would be a welcome addition. (We can fight about what language, etc., later).

While growth is measurable in terms of numbers, development defies measurement but is manifest in terms of evolution of diversity and specialisations that can be differentiated. A science channel would not be just another channel, but an indication of broadcast development.

But then, a science channel cannot just take off and sustain itself easily. At least, this is what we must surmise from the earlier failed attempts in India (by DECU), and abroad (a channel called Einstein). The restraining force is simple enough to identify: manpower. The intellectual capacity needed to deal with science and technology issues on radio or television is higher than what is needed to make a reality show or to report the changing numbers of Sensex.

The explosion of FM stations – commercial, community and campus radio – have put further strains on the supply side of manpower for the broadcast industry. The university sector in India may not be able to match their output to the needs of the industry. So the broadcast industry will grow by absorbing untrained people and let them learn on the job – as usual. But this growth alone does not necessarily lead to the development of the broadcast sector.

Challenges ahead

The next generation of science broadcasters should theoretically come from the departments of science journalism or mass communication or electronic journalism. But just as a Master's degree in mathematics does not make one a mathematician, getting a degree even in science broadcasting will not turn one into a science communicator adept at handling radio or TV media.

Broadcast media which works 24/7 expects high productivity from its human resource. A Master's degree does not train people to handle the pressure. So quite a few turn to teaching as a profession. You could take five years to write a thesis while broadcast media expects at least one programme per month, if not one or more stories every week (depending on the genre of programming).

This disconnect between education and the media industries came out clearly during the expert group discussions organised by UNESCO a few years ago, to formulate journalism curricula. The industry leaders were clear that they would prefer people who can handle content. Thus an MA in Economics is preferable for a media channel that specialises in economics and business. Once a person gets inside the industry, learning the technology and techniques of the medium is not difficult. But for a person with MA in

Mass Communication it is less easy to deal with the complexities of topics in economics and business or science.

So would injection of some scientific topics in science journalism courses help in developing the adequate human resource needed for science broadcasting? Or should we inject some topics in journalism into science courses?

One could, of course, try both strategies. But it would take quite some time to get the right kind of manpower required to create content with science coverage of more than 10% in media. (At present, it is estimated to be about 2 to 4 percent – lesser in broadcast media.)

And what indeed are the characteristics of people that the industry would need?

1. Wide range of scientific interests and curiosity beyond the narrow disciplines defined by the university system.
2. Enthusiastic and excitable about scientific ideas.
3. Ability to comprehend scientific papers from a variety of disciplines.
4. Ability and efficiency in searching the deeper web.
5. Ability to translate complex scientific ideas and concepts into simple words.
6. Ability to use literary devices - and in TV medium, visual narrative structures.
7. Reasonable understanding of audiences.
8. Ability to adapt to fast changing technologies and techniques of production.
9. A scientific attitude.
10. Reasonably good aesthetic sensibilities.

If the basic aptitudes and attitudes are available, skill building in broadcast production itself is quite easy.

However, most of the students who enroll for courses like Mass Communication, Electronic Journalism, etc., do not have a clear understanding of their own professional calling. They enroll only because of their aspirations – quite often for only the glitter and glamour of broadcast media, mostly for easy, well-paid jobs.

The students' understanding of broadcast media is based on their present habits of media consumption. Even in this information age, the mainstream media does not cover science well and students do not get exposure to good programming in science – except from some foreign channels. So the aspiration to become a science communicator in broadcast media has very little chance to arise.

So the question remains. How do we improve the quantity and quality of science programming in broadcast media?

Evidence based hope

India is far ahead of most Asian countries in terms of science content in broadcast media. While a series like Turning Point was quite natural to Indian television nearly two decades ago, it is only recently that a similar venture was undertaken in ASEAN countries and that too as a collaborative effort between six different countries. An external agency from Germany had to put in effort and money to achieve this. Meanwhile, India has progressed to the stage of tackling science in news format.

Moreover, average Indian broadcast producers are comfortable with asking questions – a characteristic which is needed for good science programmes. This is not the case in most countries in the Asia-Pacific region, where questions are perceived as a sign of mutiny against authority or, worse yet, a sign of ignorance of the questioner. For a questing spirit, cultural, social and psychological barriers are less in India compared to most countries in the region.

In spite of this, we are concerned about the low coverage of science in Indian broadcast media, because of the sheer number of broadcast channels. The diversity of languages used in those channels makes the task even more challenging.

Unfortunately, advances in science are accessible only to people with English language skills. Given the pace of advances in science and technology, and their impact on the lives of the common man, it is important that even the illiterate have adequate knowledge to make informed decisions in their lives. The slow decentralisation of decision making in our democracy makes it imperative that decision makers at the level of Panchayats and in individual households have access to relevant scientific and technological knowledge. This could perhaps be achieved if at least 10 percent of the content in broadcast media relates to science and technology. But how do we get there?

It would be difficult for a science channel to reach across to different linguistic groups in India.

How can we overcome this problem?

Sensible solutions

A three-pronged strategy is proposed here to face the present challenges in science broadcasting.

1. Train radio and television producers to identify and access scientific content relevant to their target audiences, provide tools for dealing with complex scientific content and for converting it into a language comprehensible for target audiences, build skills for structuring and telling it like a story.
2. Train interested researchers, scientists, faculty members and extension educators in the art of communicating using video technologies. Create institutional support systems to facilitate the rapid emergence of scientist broadcasters.
3. Build bridges between media academics and media industries by making the courses relevant to media industries. The focus should be on attitudes, skills and knowledge appropriate to the contemporary media environment.

The *first* strategy would focus on mainstreaming science. Unlike earlier centuries, 21st century science has a lot more studies with implication in areas like sports, economics, politics, music and even religion/spirituality.

Besides using content that is traditionally not considered as a part of science programming, we need to see the variety of genres or forms of broadcast media and see how science can be communicated using genres beyond documentary, interview and magazine formats. Science content in soap operas, music videos etc., has also to be given adequate attention.

Thus the first strategy focuses on generalising or mainstreaming science, in terms of both content and style.

The *second* strategy, however, focusses on specialising. It focusses on a very narrow band of target group of scientists, researchers and teachers – only those who are keen should be trained. Here the focus would not be on content, but on the technology, on the processes of production, on aesthetics and on communication strategies for specific audiences.

The *third* strategy focusses on science journalism courses and mass media/electronic media courses with a science communication paper. To improve the quality and relevance of the courses, the curricula need to be improved.

Practical projects

On the basis of the first two strategies, two workshop curricula were needed. The first one is ready: a five

-day workshop on Broadcasting Science for radio and TV producers. The modules have been tested in Indonesia, Malaysia and Sudan. The first one in the series was conducted in the first week of May 2011 with support from Vigyan Prasar. A few more are in pipeline.

The draft of the second one, a 12-day workshop for scientists, researchers and extension workers is also ready now. A workshop that empowers those who have content to use the technology 1) to document their research (one might skip materials and methods in a journal report, but on video it is exciting viewing); 2) to train students about using complex scientific equipment; and 3) to use in extension education.

Last generation gave us a Prof. Yash Pal, Narlikar, Bala, etc. - scientists and science managers who

became communicators. Let us facilitate the development of the next generation of science communicators for the new media environment. Identifying potential science communicators who will adapt easily to soft button technologies and use them with aesthetic sense for telling their stories should keep me occupied for some time.

The third strategy will become easy in execution if NCSTC and UGC agree to co-operate (or UNESCO prompts the Ministry of Human Resources to take cognizance of the curricula developed at an international level). The issue is beyond the scope of this article: it is on science broadcasting, not journalism education.

As happened in the past, will chance bring me the right job to do this task? I am not sure. But it sure looks like I have a lot of work ahead.



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